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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,158	12/10/2004	Jean-Michel Reynes	SC0985ET	2901

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FREESCALE SEMICONDUCTOR, INC.  
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AUSTIN, TX 78729

EXAMINER
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INGHAM, JOHN C

ART UNIT	PAPER NUMBER
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2814

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/518,158

Applicant(s)

REYNES ET AL.

Examiner

John C. Ingham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6,7,10,11 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6,7,10,11 and 14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The amendments to the claims and specification have been entered. And the objection to the title has been withdrawn.

### ***Claim Objections***

2. Claim 11 is objected to because of the following informalities: The claim depends from claim 0, instead of claim 10. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims **6-7, 10-11 and 15-16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Neilson (US 5,399,892) and Tsoi (US 5,631,484).

6. Regarding claims **10, 11 and 15-16**, Neilson discloses in Fig 10 a method for manufacturing a power semiconductor device comprising forming a two-dimensional array of individual cells from a first surface of a semiconductor substrate, each individual cell having source regions (46) within a single and substantially uniformly doped base region (50) surrounding said source regions of the individual cells of said array, and forming a patterned insulated gate region (56) at said first surface, wherein the source regions of the individual cells of the array comprise a plurality of source region branches (46) each extending radially towards at least one source region branch of an adjacent cell (Fig 10), the source region branches of adjacent cells presenting juxtaposed ends.

Neilson shows a plurality of base region branches extending radially towards base regions of adjacent cells (Fig 10) to present juxtaposed ends, but does not disclose wherein forming said single and substantially uniformly doped base region comprises the steps of: using said patterned insulated gate region in forming a plurality of base region branches extending radially towards at least one base region branch of an adjacent cell to present juxtaposed base region ends, subsequently merging together the base region branches of adjacent cells adjacent and between said juxtaposed base region ends to form said single and substantially uniformly doped base region. Instead Neilson photo-masks the body regions for implantation, and strips the mask prior to depositing the gate insulators and electrodes.

Tsoi teaches that insulated gates can be deposited first in order to ion implant self-aligned base and source regions with a reduced number of masking steps (col 1 ln 30-35 and col 3 ln 59-62). A subsequent diffusion and activating merges the dopant between juxtaposed base contacts (col 4 ln 7-9) before the source regions are implanted (col 4 ln 23-25). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Tsoi in the method of Neilson in order to produce self-aligned base and source regions with a reduced number of masking steps.

7. Regarding claim 6, Neilson discloses in Fig 10 the method of claim 10 wherein the device comprises at least one drain electrode (unlabeled, below item 40) contacting a face of said semiconductor substrate opposite said source regions.

8. Regarding claim 7, Neilson discloses in Fig 10 the method of claim 10 wherein the device comprises physically isolated drain regions (52) in the substrate and wherein said physically isolated drain regions have a depth equivalent to the depth of said base regions (50).

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neilson and Tsoi as applied to claim 10 above, and further in view of Knoch (US 5,703,389). Neilson and Tsoi do not disclose wherein the ion implant is of high voltage breakdown resistance.

Knoch teaches in Fig 4 a similar cell type FET wherein the well region (36) is a base with enhanced breakdown characteristics (col 4 ln 60-61), making it suitable for

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high voltage applications. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Knoch in the method of Neilson in order to produce a device with an ion implant suitable for high voltage applications.

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 6-7, 10-11 and 14-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamamoto (US 5,521,410) discloses a similar structure that is not radial but has implanted self aligned base regions which are diffused and merged (Fig 7-9). Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Ingham whose telephone number is (571) 272-8793. The examiner can normally be reached on M-F, 8am-5pm.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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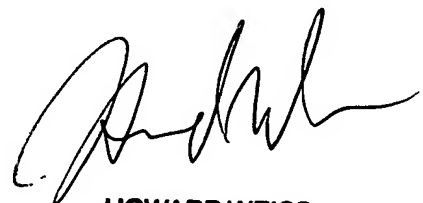
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

John C Ingham  
Examiner  
Art Unit 2814

jci



**HOWARD WEISS**  
**PRIMARY EXAMINER**